Status of E-906/SeaQuest

– an unpolarized fixed-target Drell-Yan experiment

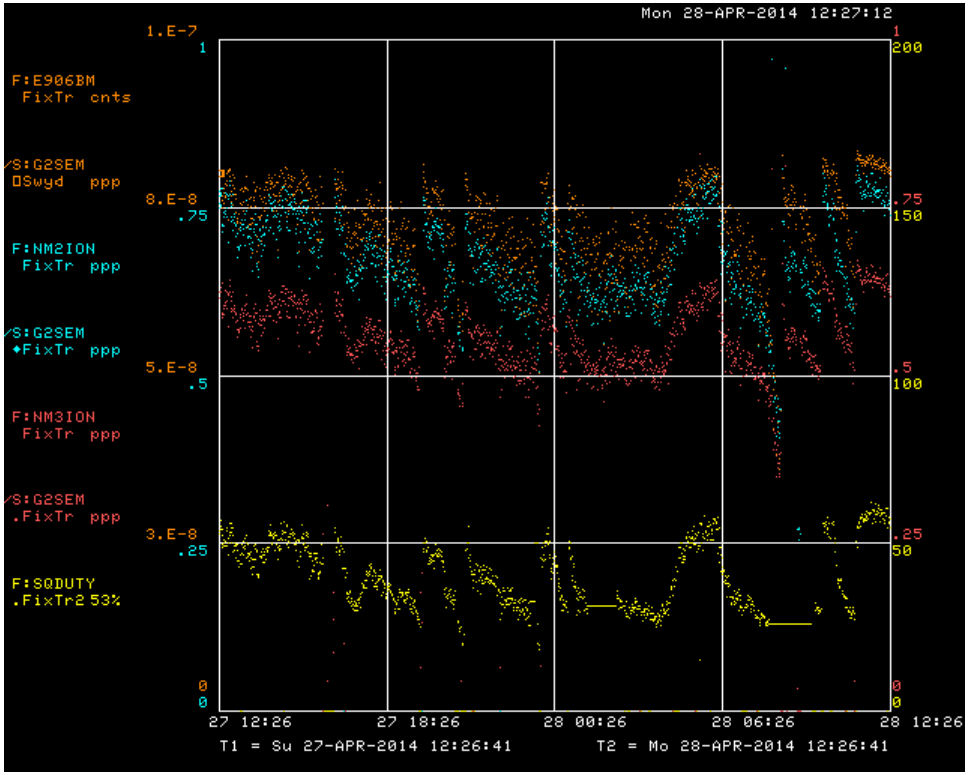
Markus Diefenthaler (UIUC)

Beam Status

- **shutdown** due to mandatory repair of cooling towers for SeaQuest magnets:

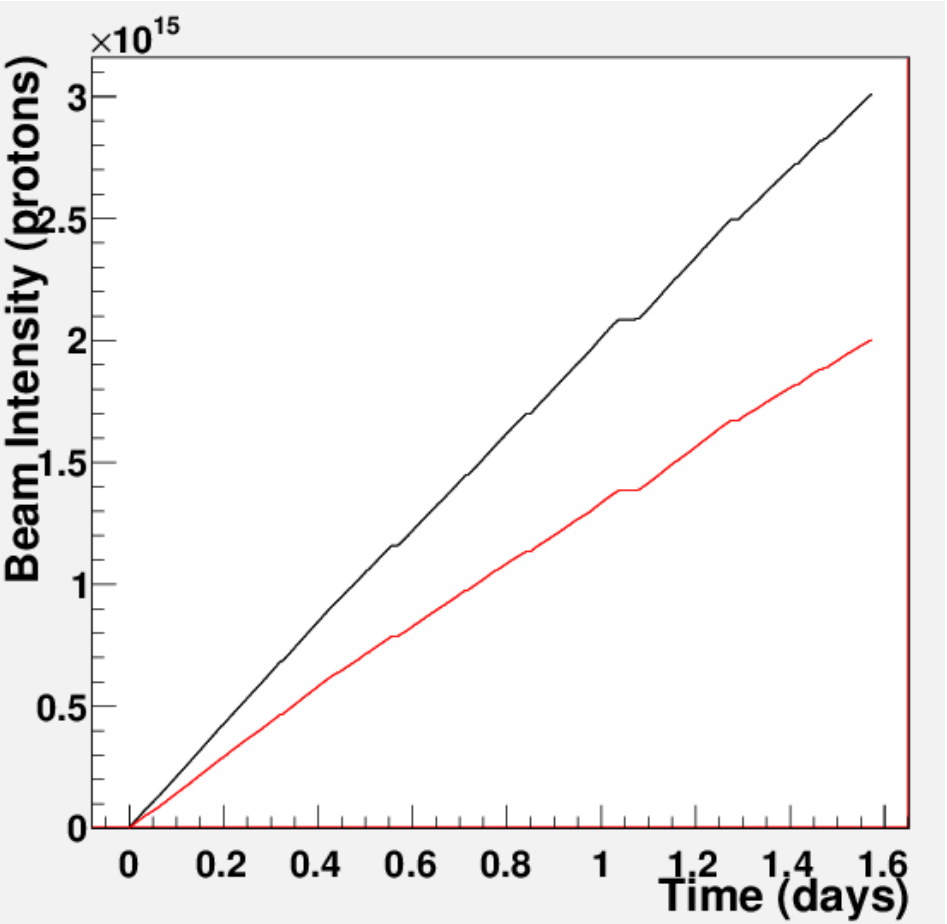
  Monday (04/21) **morning** (07:00 a.m.) – **Friday** (04/25) **night** (11:30 p.m.)

- after restart:
  - duty factor @ 53 ~ 25%, low beam quality caused by QXR problems
  - but improved over weekend: duty factor @ 53 ~ 35% – 55%
  - ***spiky* beam** of degrading quality due to MECAR problems



Limited Data Taking

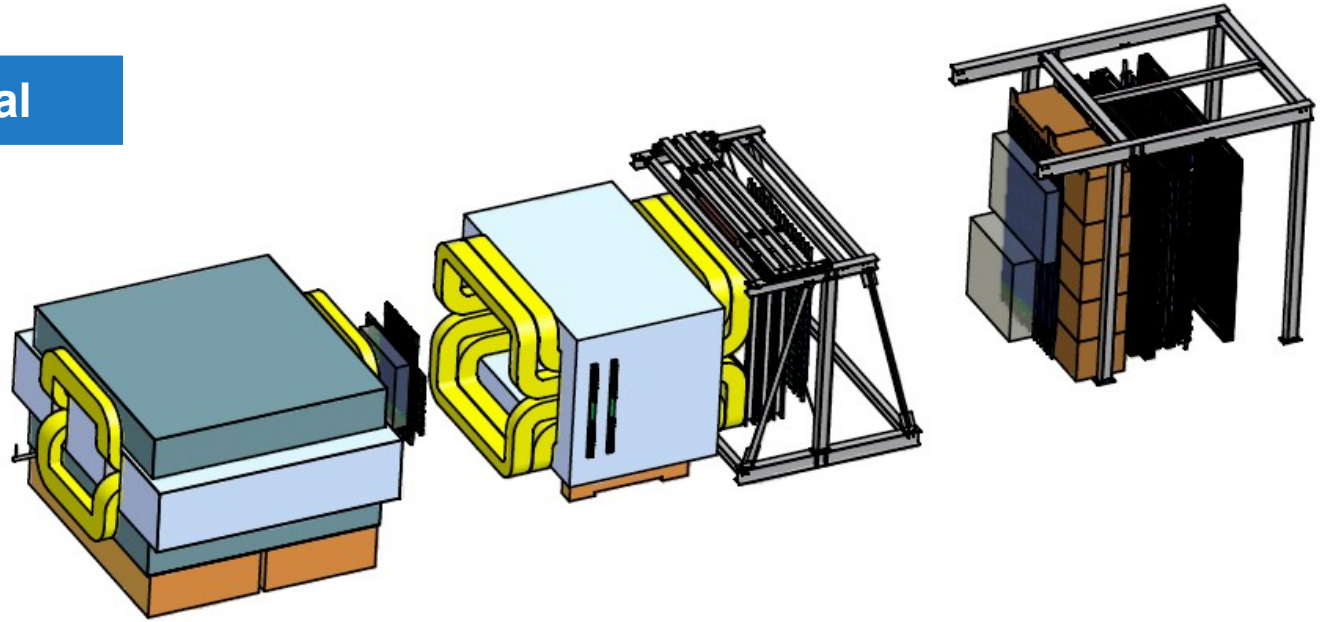
- **periods with no beam:**
  - 04/21: 07:00 a.m. – 04/25: 11:30 p.m.
  - 04/27: 02:00 a.m. – 04:00 a.m., 09:15 a.m. – 11:00 a.m.
- **data taking for about two days:**



- **integrated beam intensity:** G2SEM: 5.34217e+15 (NM3ION: 3.00971e+15)

Spectrometer Status and Plans

Operational



Target	target positions calibrated, LH2 and LD2 targets filled and cycling, calibrated new Setra pressure sensor, tested new flammable gas detector, miscommunication about test resulted in visit of fire department
FMAG (2000A) **KMAG** (1600A)	operational, improved cooling, precise magnetic field calibration (<1%)) requires J/Psi analysis with high statistics
Hodoscopes	timed in precisely (+/- 1ns), high efficiency but additional HV tuning required (sagging?), well tested during trigger studies
Drift Chambers	operate stable (also at 2e12 ppp), large fluctuations in beam intensity revealed effect of beam intensity on chamber efficiency → re-calibration
DAQ	continuous data taking, reduced DAQ dead time < 140us, unstable beamDAQ due to problems with new firmware for QIE board and new readout software → unstable beam monitoring

Trigger Status

- PMT-by-PMT timing set by cable delays, verified to be stable
- road pulser tests of **FPGA trigger firmware:**

  100.0% efficiency and 100.0% purity
- **trigger road selection** optimized in full Geant MC simulations for:
  - good DAQ livetime
  - good acceptance rate of Drell-Yan events
  - consensus on main road sets (L1) and requirements for road combinations (L2)
  - removal of *hot* roads based on data and MC simulations
- **extensive trigger studies:**
  - NIM diagnostics trigger limited at high rates
  - FPGA trigger purity 100%
  - ongoing work to optimize FPGA trigger efficiency of about 95%
  - **now:** optimize amount of reconstructed data for given beam inhibit threshold
  - open question: what is the best threshold to optimize a) number of reconstructed J/Psi events and b) number of reconstructed Drell-Yan events